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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/919,522	07/31/2001	Stanley F. Wyse	L-390	3654

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EXAMINER

LE, DAVID D

ART UNIT	PAPER NUMBER
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3681

DATE MAILED: 09/17/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/919,522

Applicant(s)

WYSE, STANLEY F.

Examiner

David D. Le

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 July 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Documents***

1. The following documents have been received and filed as part of the patent application:

- Declaration and Power of Attorney, received on 01/14/02
- Drawings, received on 04/15/02

### ***Specification***

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

3. The abstract of the disclosure is objected to because the current abstract has exceeded 150 words. Correction is required. See MPEP § 608.01(b).

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

**Claim 1-12:**

Claim 1 recites the limitations "the path of oscillatory travel", "the rotor", the angular displacement", and "the effect of torque" in the claim. There is insufficient antecedent basis for these limitations in the claim.

**Claim 2:**

Claim 2 is further indefinite because it recites the limitation "the derivative of said first signal" in the claim. There is insufficient antecedent basis for this limitation in the claim.

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**Claim 3:**

Claim 3 is further indefinite because it recites the limitations "the gain of said at least one cross-axis circuit" and "the nutation frequency of said rotor" in the claim. There is insufficient antecedent basis for these limitations in the claim.

**Claim 4:**

Claim 4 is further indefinite because it recites the limitations "the transfer function  $T(s)$  of said at least one cross-axis circuit" and "the nutation frequency of said rotor" in the claim. There is insufficient antecedent basis for these limitations in the claim.

**Claim 8:**

Claim 8 is further indefinite because it recites the limitation "the derivative of an input signal" in the claim. There is insufficient antecedent basis for this limitation in the claim.

**Claim 9:**

Claim 9 is further indefinite because it recites the limitations "the gain of each cross-axis circuit" and "the nutation frequency of said rotor" in the claim. There is insufficient antecedent basis for these limitations in the claim.

**Claim 10:**

Claim 10 is further indefinite because it recites the limitation "the transfer function  $T(s)$  of each of said cross-axis circuit" and "the nutation frequency of said rotor" in the claim. There is insufficient antecedent basis for these limitations in the claim.

6. Claims 13-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

**Claims 13-16:**

Claim 13 recites the limitations "the effect of torque applied" and "the spinning rotor of a gyroscope" in the claim. There is insufficient antecedent basis for these limitations in the claim.

**Claim 14:**

Claim 14 is further indefinite because it recites the limitation "the derivative of said first signal" in the claim. There is insufficient antecedent basis for this limitation in the claim.

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**Claim 15:**

Claim 15 is further indefinite because it recites the limitations "the transfer function of said cross-axis circuit" and "the nutation of frequency of said rotor" in the claim. There is insufficient antecedent basis for these limitations in the claim.

7. Claims 17-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

**Claims 17-20:**

Claim 17 recites the limitation "the effect of said torque applied" in the claim. There is insufficient antecedent basis for this limitation in the claim.

**Claim 18:**

Claim 18 is further indefinite because it recites the limitation "the derivative of said torque applied" in the claim. There is insufficient antecedent basis for this limitation in the claim.

**Claim 19:**

Claim 19 is further indefinite because it recites the limitation "the nutation frequency of said rotor" in the claim. There is insufficient antecedent basis for this limitation in the claim.

**Claim 20:**

Claim 20 is further indefinite because it recites the limitation "the nutation frequency of said rotor" in the claim. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-3, 5, 7-9, 11, 13-14, and 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by U. S. Patent No. 5,138,883 to Paquet et al.

**Claims 1, 13, and 17:**

Paquet (column 2, lines 18-68; column 3, line 33 – column 4, line 46) discloses a typical two-degree-of-freedom, dry tuned rotor gyroscope comprising:

- a first forcer for applying a torque with respect to a first axis of said rotor in response to a first signal (column 2, lines 24-68);



- a second forcer for applying a torque to said rotor with respect to a second axis, orthogonal to said first axis, in response to a second signal (column 2, lines 24-68); and
- a cross-axis circuit for receiving said first signal and generating said second signal in response so that said second signal drives said second forcer to precess said rotor with respect to said first axis to substantially cancel the effect of torque applied to said rotor with respect to said first axis by said first forcer (column 2, lines 24-68);

**Claims 2-3, 5, 7-9, 11, 14-15, 18-19:**

Paquet (column 2, lines 18-68; column 3, line 33 – column 4, line 46) also discloses

- wherein said at least one cross-axis circuit generates said second signal comprising the derivative of said first signal (column 5, lines 16-37);
- wherein the gain of said at least one cross-axis circuit is inversely proportional to the nutation frequency of said rotor (column 8, lines 54-68);
- wherein said at least one cross-axis circuit comprises an operational amplifier (column 7, line 67 - column 8, line 1);
- a second cross-axis circuit arranged to receive said second signal and to generate said first signal in response thereto (column 2, lines 24-30);

***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 4, 6, 10, 12, 15-16, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paquet et al. in view of U. S. Patent No. 4,189,946 to Hoffman et al.

**Claims 4, 6, 10, 12, 15-16, and 20:**

Paquet discloses all elements and limitations as set forth in claims 1, 5, 7, 11, 13, and 17. Regarding claims 4, 6, 10, 12, 15-16, and 20, Paquet lacks:

- wherein the transfer function  $T(s)$  of said at least one cross axis circuit is  $T(s) = Ks / (s + 2\pi k f_{\text{nut}})$  where  $k$  is an integer and  $f_{\text{nut}}$  is the nutation frequency of said rotor;
- wherein said at least one cross-axis circuit comprises an operational amplifier including a feedback resistor in parallel with a feedback capacitor;

Hoffman (column 3, lines 41-57; column 7, lines 8-19) discloses a three-axis gyro comprising all elements and limitations that Paquet lacks above.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Paquet reference to include the transfer function equation and further to replace Paquet series type of arrangement amplifier with a parallel type of arrangement between the feedback resistors and capacitors in view of Hoffman in order to provide an gyroscope with an improved angular rate sensing capability.

### *Conclusion*

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Friedland (U. S. Patent No. 4,189,947) teaches an electrical circuit interposed between the pickoffs and torquers of a two-axis gyroscope comprising an equation for the transfer functions. The circuit output controls the torquers. When the pickoff signals vary at the nutation frequency, the angular accelerations produced by the torquers damp the nutation.

Duncan et al. (U. S. Patent No. 4,848,469) teaches a two-degree of freedom, open loop, spring restrained rate gyro apparatus including a motor mounted in a housing with a conductive device provided for conducting operating voltages into and out of the housing.

Quermann (U. S. Patent No. 4,487,083) teaches an integrated pickoff, torquer, and reference signal generator system for a two-degree-of-freedom flexure-suspended free-rotor gyroscope.

Hrastar (U. S. Patent No. 4,458,554) teaches an apparatus for and a method of compensating dynamic unbalance comprising a fixed body by a rotating body that is connected to the fixed body by a shaft about which the rotating body rotates.

Grohe (U. S. Patent No. 4,320,669) teaches a two-degree of freedom gyro having an axial gap and a permanent magnet motor.

Davis et al. (U. S. Patent No. 3,762,226) teaches a vehicle control mounted moment gyroscopic apparatus, which employs a closed loop torque feedback system including a gyroscopic rotor disposed within a shell-like housing.

Scott (U. S. Patent No. 4,591,117) teaches an active nutation damping system for a spacecraft comprising a nutation sensor controlling an actuator, a thruster, and a control system to produce nutation opposing torques.

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Atkinson et al. (U. S. Patent No. 3,906,804) teaches an electrostatically supported ball type gyroscope speed control system for maintaining the rotational speed of a ball, which is mass unbalanced about its spin axis, at a preselected speed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David D. Le whose telephone number is 703-305-3690. The examiner can normally be reached on Mon-Fri (0700-1530).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Marmor can be reached on 703-308-0830. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7687 for regular communications and 703-305-7687 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.

ddl

ddl

September 12, 2002



RODNEY H. BONCK  
PRIMARY EXAMINER  
ART UNIT 3681